Zoologica, Vol. IX, No. 8.

ON THE EXTINCT GALAPAGOS TORTOISE THAT INHABITED CHARLES ISLAND*

By R. Broom, F.R.S.

(Figs. 306–309 incl.)

The discovery by Dr. C. H. Townsend of a large number of specimens of the Charles Island tortoise is an event of considerable importance in herpetology. Up till 1832 giant tortoises were abundant in Charles Island, but in that year the island was colonized by several hundred settlers from Ecuador, and within a very few years the tortoises became so rare that the colonists sent hunting parties to the other islands for supplies, and even the few small ones that may have remained were probably soon killed off by the dogs and pigs that had been introduced by the settlers. Almost certainly the native tortoises of Charles Island were extinct by 1850; and any specimens collected there after this date are most likely to have been specimens brought from neighboring islands by the settlers.

Owing to the early extinction of the Charles Island tortoise there was for long considerable doubt as to what species it was and even till now there has been uncertainty as to the name that ought to be given it.

* It would be difficult to imagine a more effective trap for tortoises than the well-like entrance to the cave on Charles Island from which the skeletons were taken.

It must have operated automatically as a death-trap for centuries. The brushy half-concealed entrance is merely a hole in the ground a dozen feet in diameter and twenty feet deep. With a steep slope at one side, the unlucky tortoise that tumbled in did not necessarily strike bottom with a fatal crash, but rather rolled down an incline it could not ascend.

The rocky floor of the cave is not wide but leads into a few low passages under the lava, all strewn with dry bones of tortoises that had crept everywhere in search of an outlet. The brittle remains of the earlier victims had been crawled over repeatedly and gradually broken up by those that were entrapped subsequently from time to time.

It is not likely that the latest and best preserved of these entered the cave less than ninety years ago. According to the log-book records of seventy-nine whaleships examined by the writer, the last tortoises were taken from Charles Island in 1837.

The bleached and bony remains of those not too antiquated and fragile to be removed, had long lost their dark horny plates which lay curled and twisted beside them. In a dozen of these, both carapace and plastron were practically intact, while skulls and leg bones had usually been disturbed and scattered. A considerable amount of broken tortoise remains had long since become mixed with the soil of the cave floor. The later arrivals lay where they died, their large white carapaces showing conspicuously as our flashlights were turned in their direction. *Townsend, Bulletin N. Y. Zool. Soc. Sept.–Oct. 1928.*

We have a few interesting references to the tortoises in the works of some of the early voyagers.

In 1812 Captain Porter of the U. S. Navy spent some time in the Galapagos Islands and as he was a good naturalist he has given us some interesting observations on the tortoises. He was apparently the first to recognize that there were different species on the various islands. He visited Hood, Narborough, James, Charles and Indefatigable Islands and found tortoises abundant on all of them.

The following is his reference to the Charles Island species: "Those of James Island appear to be a species entirely distinct from those of Hood and Charles Islands. The form of the shell of the latter is elongated, turned up forward in the manner of a Spanish saddle, of a brown color and of considerable thickness. They are very disagreeable to the sight, but far superior to those of James Island in point of fatness, and their livers are considered the greatest delicacy. Those of James Island are round, plump, and as black as ebony, some of them handsome to the eye . . . The tortoises of Hood's Island were of a quality far superior to those found on James Island. They were similar in appearance to those of Charles Island, very fat and delicious."

In 1833 Commodore John Downes visited the Galapagos Islands in the U. S. Frigate "Potomac" and collected a large number of tortoises. He is known to have landed only on Charles Island. Mr. T. N. Reynolds who voyaged with Commodore Downes gives a short account of the tortoises in his voyage of the Potomac. He says: "From the last of May to December, embracing the rainy season, the Terrapin leaves the mountains and high grounds and may be found spread in all directions over the plains and low grounds near the sea, where they feed principally upon prickly pear, and find water in the little lakes in the crevices of rocks. From January to May, as the dry season advances, they return again to the high ground where the trees are larger, vegetation more abundant and where springs may be found issuing from the sides of the mountains. These watering places became much frequented and paths leading to them may be traced for a great distance along the sides of the hills; and I have seen in many places the roads worn away more than six feet in depth, and just sufficiently wide to allow them room to pass. At these springs hundreds of them are often

seen at a time waiting their turns to drink, or, becoming impatient, pile themselves one upon another, in their efforts to obtain water. When satisfied, they again return by the little roads hewn through the soft rocks and again disappear amid the thick underwood."

On his return to Boston in the summer of 1834 Commodore Downes presented to the Boston Society of Natural History the two largest of the tortoises he had brought home with him. One of these was dissected by Dr. J. B. S. Jackson who published in 1837 a description of both the external characters and the internal anatomy. He believed that there was only one species of Testudo on the Galapagos Islands and naturally assumed that his tortoise belonged to the species described by Harlan in 1827 as *Testudo Elephantopus*.

Jackson gives the color of the upper shell as "deep brown, almost black" and the under shell he says has a light shade of the same color, and the surface is more rough than that of the upper. The color of the female he states was similar to that of the male.

Harlan's specimen of Galapagos tortoise described in 1827 has apparently been lost, and we can now judge of the species by his rather poor figure. His description and figure do not enable us to identify his species and it seems wisest to regard *Testudo Elephantopus* as an indeterminate species. In any case it is almost certainly not the Charles Island species. This was the opinion of Baur who in 1890 gave to Jackson's Charles Island specimen the name Testudo galapagoensis, and Gunther, one of the greatest herpetologists who has ever lived, confirmed Baur's opinion.

Van Denburgh, who in 1914 published a most exhaustive report on the tortoises of the Galapagos Islands, believed Jackson's specimen to be the same species as Harlan's and retained the name *T. Elephantopus* for the Charles Island form.

In 1917, S. Garman also published a large paper on the Galapagos tortoises, but as it regards Baur's *T. galapagoensis* as a synonym of *T. nigra* of Quoy and Gaimard 1824; and under *T. elephantopus* which he considers entirely different he places as synonyms *T. ephippium, T. abingdoni, T. becki, T. bedsi, T. hoodensis* and *T. phantastica*—all saddle-backed types though Harlan's specimen judging by the figure was not a saddle-backed type at all.

While agreeing with most of Van Denburgh's conclusions, I

believe Baur and Gunther were right about the distinctness of the Charles Island form, and the large series of specimens discovered by Dr. Townsend not only gives us an excellent idea of the Charles Island species but confirms Baur's view that it is a distinct species.

Most of the specimens got by Dr. Townsend are between 50 and 60 centimeters in length. One is a very large one—unfortunately imperfect—and one is comparatively young.

The largest specimen which is evidently a male probably when perfect measured 85 centimeters in greatest length from front to back as it stands on the plastron or probably about 96 centimeters in oblique measurement. It probably measured about 105 centimeters over the carapace from front to back but as all the posterior half of the carapace is gone the posterior end can only be estimated roughly from the position of the back of the plastron. The circumference of this large specimen round the widest part is about 170 centimeters.

As will be seen from the photographs given the front of the carapace is high, and the sides much pushed together, giving the well known Spanish saddle-back, though the degree of constriction is less than in *T. abingdoni, T. phantastica,* and *T. becki,* the agreement being more close to *T. ephippium* and *T. hoodensis.* The height of the anterior opening from the upper part of the plastron to the inner border of the upper part of the carapace is 346 mm. and the greatest width of the opening 404 mm.

The plastron measures in greatest length in the middle line 650 mm. and the length of the bridge between the limbs is 310 mm. on one side and 318 mm. on the other. The plastron is much hollowed out, especially in the posterior half. The anterior process is long and narrow and truncated in front. Posteriorly the plastron is also transversely truncated.

The only epidermal shields preserved in this specimen are the 1st marginal of the right side and the 2nd marginals of both sides. All are a dark brown, but where weathered or rather perhaps rubbed in front they are of a dirty light brown color. In the collection are numerous detached shields of specimens and while some are a very dark brown—almost black—many of the shields of the plastron are quite light brown—almost yellow.

A smaller specimen is nearly perfect. It measures in curved length over the carapace 730 mm. and in greatest circumference

Fig. 306. Tortoise of Charles Island, Galapagos. (*Testudo galapagoensis*) Bauer. Side view.

1060 mm. The plastron measures in the middle line 483 mm. and the bridges measure 243 mm. on the one side and 245 mm. on the other.

The views given will show the general arrangement of the shields and bony plates. Though this is a young specimen, the anterior end of the carapace makes a distinct approach to the Spanish saddle, but only in a very slight degree as compared with the large specimen. The bones of the carapace in this specimen as in all the others are thin and easily broken and the whole carapace is rather loosely attached to the marginals, narrow fontanelles being very often present between the costals and the marginals, and even where the fontanelles are the union is delicate.

There are in the collection eight skulls and three mandibles. The skulls differ somewhat from that figured by Gunther. The jugal arch, as will be seen from the figure given, is considerably narrower and placed lower on the side of the skull. This character is constant in all the skulls in which it is preserved. The posterior muscular process formed by the ex- and basi occipitals is much less developed than in Gunther's specimen but in all other characters the agreement is fairly close.

There are preserved many bones of the skeleton but for the most part not in association with the carapace.

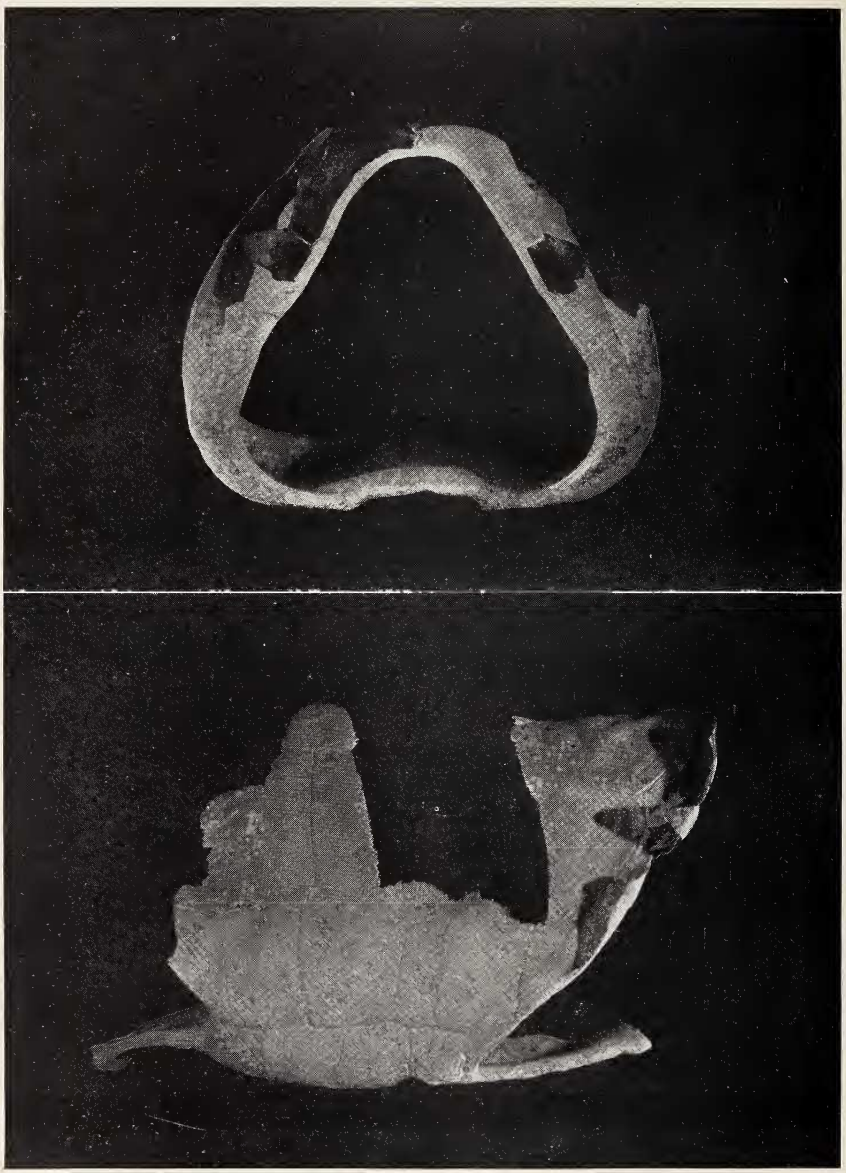

Fig. 307. Tortoise of Charles Island, Galapagos. (*Testudo galapagoensis*) Bauer. *Upper:* anterior view. *Lower:* side view.

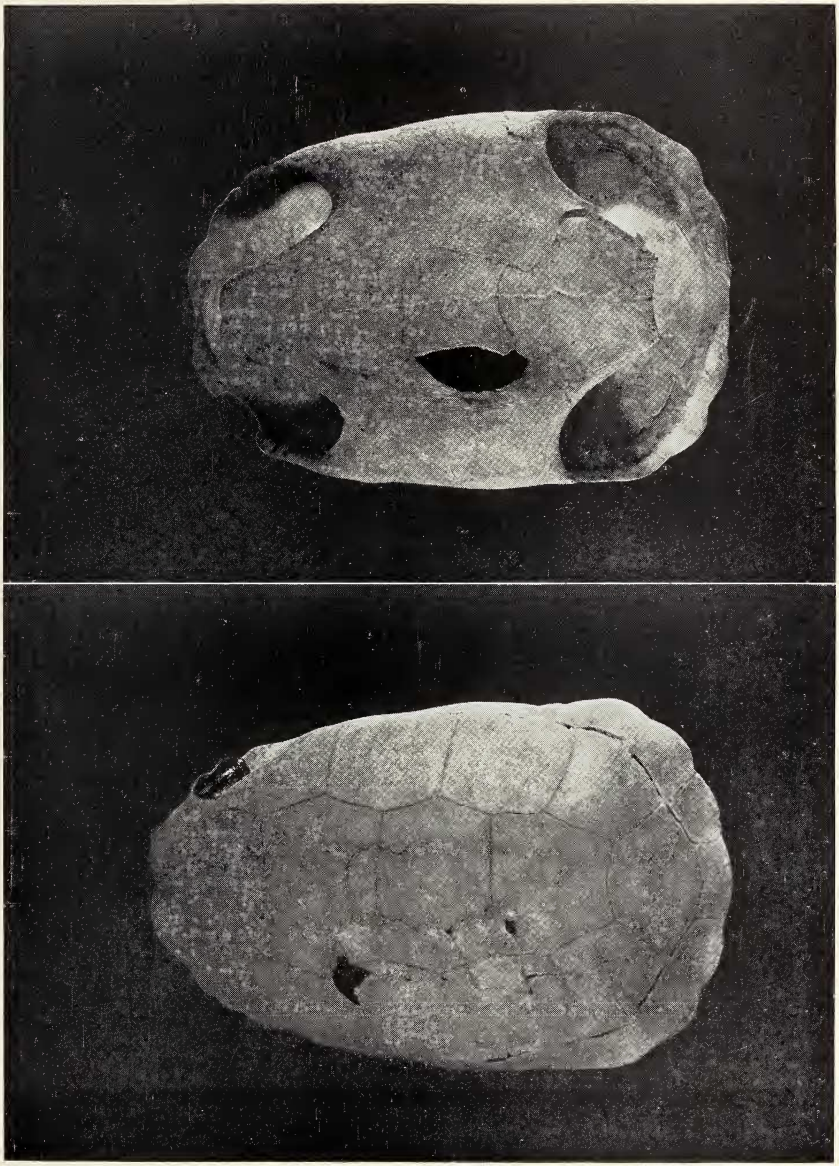

Fig. 308. Tortoise of Charles Island, Galapagos. (*Testudo galapagoensis*) Bauer. *Upper:* carapace from above. *Lower:* plastron.

Fig. 309. Extinct Tortoise of Charles Island, Galapagos. (*Testudo galapagoensis*) Bauer. *Upper:* side view of skull. *Lower:* upper surface of skull.